Calculation of reaction cross sections for several actinides

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Based on experimental fission yield and cross section data, new, self consistent, neutron-induced reaction cross section calculations for ^{235,238}U, ^{237}Np and ^{231,232,233}Pa have been performed.

The statistical model code STATIS was improved to take into account the multi-modality of the fission process. The three most dominant fission modes, the two asymmetric standards I (S1) and standard II (S2) modes and the symmetric superlong (SL) mode have been taken into account. De-convoluted fission cross sections for those modes for ^{235,238}U(n,f) and ^{237}Np(n,f) based on experimental branching ratios, were calculated for the first time up to the second chance fission threshold. For ^{235}U(n,f) and ^{233}Pa(n,f), the calculations being made up to 20 MeV incident neutron energy, higher fission chances have been considered. This implied the need for additional calculations for the neighbouring isotopes.

As a side product also mass yield distributions could be calculated at energies hitherto not accessible by experiment. Experimental validation of the predictions is being envisaged.

The most intriguing results will be presented.

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